

Remarks

By the foregoing amendment, claims 37, 38, 42, 47, 61, 64, and 67 are amended, and new claim 70 is added. Applicants respectfully submit that no new matter was added by the amendment, as all of the amended matter was either previously illustrated or described in the drawings, written specification and/or claims of the present application. For example, the necessary support for the amendments may be found in paragraphs [0075]-[0077] of the specification and Fig. 5a. Entry of the amendment, and favorable consideration thereof, is earnestly requested. Claims 37-70 are currently pending.

Objection to Specification/Claims

The Examiner has objected to the specification on the ground that it refers to Fig. 6 as Fig. 6a and Fig. 6b, while the drawings only contain Fig. 6. Applicants hereby amended the specification to delete references to Figs. 6a and 6b.

The Examiner has also objected to claim 42 because of informality. Applicants hereby amended claim 42 in accordance with the Examiner's suggestion.

In view of the above amendments, Application respectfully requests withdrawal of these objections.

Claim rejections – 35 USC § 102

The Examiner has rejected claims 37, 40, 41, 47, 50, and 51 under 35 U.S.C. 102(a) as being anticipated by WO Pub. No. 2003/104645 (Wobben I). Applicants respectfully request reconsideration and withdrawal of this rejection in light of the foregoing amendment and the following remarks.

The present invention, as variously recited in claims 37 and 47, is directed to a handling system and a method of handling a wind turbine blade at least during storage, transport or mounting of the blade. The system includes, among other things, at least two mounting holes penetrating a surface of the blade, one or more handling means to be positioned on the surface of the wind turbine blade, and at least two mounting means to be mounted in at least two holes. These claims have been amended to recite that the mounting means extend through the wind turbine blade on opposite sides of a strengthening structure inside the blade. The present invention provides an advantageous method and system of handling a wind turbine blade during storage, transport or mounting, which are less complicated in construction features, size and use.

Wobben I discloses a transportation or handling system for a wind turbine blade in a horizontal position. (See, e.g., Fig. 2). The system includes a transport box (1) to anchor a section of the blade during the transport or handling. (Figs. 1-3). A number of air filled cushions (24) are used in one embodiment of Wobben I to anchor the blade (29) in relation to the upper and lower plate (10, 16) of the box. (See Fig. 2). In another embodiment of Wobben I, the wind turbine blade (29) is positioned in the box and “loosely” penetrated from above by a carrier bar (30) with an air filled cushion (34) or a plate (36) as a locking member. (Col. 4, lines 29-37 and 45-46). A carrier plate (32) is attached to the carrier bar forming a lower contact surface for the wind turbine blade. (See Figs. 4 and 5). The carrier bar of Wobben I serves the purpose of ensuring that the blade does not slide out of the box, i.e. a support function while the blade is primarily anchored with air cushions inside the box.

However, Wobben I does not disclose that the carrier bar is extended through the wind turbine blade on opposite sides of a strengthening structure inside the blade, such as a blade beam, as claimed. Such design allows one to securely attach the handling means to the wind turbine blade via the mounting means, without requiring additional

locking structures. In contrast, according to the system disclosed in Wobben I, additional structures, such as air cushions or a locking member, are necessary to securely anchor the blade inside the transport box.

It is well settled that “a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Because Wobben I fails to disclose at least “mounting means extending through the wind turbine blade on opposite sides of a strengthening structure inside the blade,” this reference cannot anticipate any of the pending claims.

Claim rejections – 35 USC § 103

The Examiner has rejected claims 44-46 under 35 U.S.C. 103(a) as being unpatentable over Wobben I in view of U.S. Pat. No. 6,371,730 (Wobben II), and further in view of U.S. Pat. Appl. No. 2003/0116262 (Stiesdal et al.). The Examiner has also rejected claims 61-63, 65, and 66 under 35 U.S.C. 103(a) as being unpatentable over Wobben I in view of Wobben II. The Examiner has further rejected claims 67-69 under 35 U.S.C. 103(a) as being unpatentable over Wobben I in view of WO Pub. No. 03/100249 (Bervang). The Examiner has also rejected various dependent claims. Applicants respectfully request reconsideration and withdrawal of these rejections in light of the foregoing amendment and the following remarks.

Claims 37, 47, 61 and 67 Are Patentable Over The Cited Prior Art

As discussed above, Wobben I fails to disclose or teach at least “mounting means extending through the wind turbine blade on opposite sides of a strengthening structure inside the blade,” as recited in claims 37, 47, 61 and 67, as amended. This feature is similarly not disclosed by other prior art references cited by the Examiner.

Wobben II discloses a system for attachment of a wind turbine blade (2) to a rotor hub flange (4). The blade includes pocket holes (12, 14) extending from the blade surface into the interior of the blade root. (Col. 5, lines 19-22). The holes are provided from the surface with bolt heads (16, 18) that work together with the threaded elements/bolts (20, 22). (Col. 5, lines 28-34). The tensioning elements (20, 22) extend through bores (24, 26) arranged inside the blade (2), as well as through bores inside the flange section (4), and establish build-in attachment bolts for the blade. (See Fig. 2). However, nowhere does Wobben II disclose, teach or even suggest a method for handling a wind turbine blade. In contrast, Wobben II is directed to an attachment system for attachment of the wind turbine blade to the rotor hub. Wobben II also does not disclose mounting means extending through the wind turbine blade interior on opposite sides of a strengthening structure inside the blade, as claimed.

Bervang discloses a method of handling a wind turbine blade by use of a gripping unit holding onto the blade surface. (See Figs. 2b and 2c). However, Bervang does not disclose “mounting holes penetrating the surface of the blade.” Additionally, Bervang does not disclose “mounting means extending through the wind turbine blade interior on opposite sides of a strengthening structure inside the blade.”

Obviousness requires a suggestion of all the elements in a claim (*CFMT, Inc. v. Yieldup Int'l Corp.*, 349 F.3d 1333, 1342 (Fed. Cir. 2003)) and “a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.” *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741, 82 USPQ2d 1385 (2007). Here, we find that the Examiner has not identified all elements of the present invention (namely, mounting one or more handling means including at least two mounting means in the at least two holes where the mounting means extend through the wind turbine blade on opposite sides of a strengthening structure inside the blade), nor provided a reason that would have prompted the skilled worker to have arranged them in the manner necessary to reach the claimed invention.

Accordingly, as the cited prior art references fail to disclose at least the above-listed limitations, the present invention is novel and patentable over these references.

Claim 44 Is Patentable Over The Cited Prior Art

Claim 44 recites a method of manufacturing a wind turbine blade to be handled, including the steps of manufacturing at least a first and second shell of a wind turbine blade, reinforcing at least one hole area of an inner surface of at least one of the shells by applying further layers of material, and establishing at least one mounting hole penetrating surface of the wind turbine blade at the at least one hole area.

As discussed above, Wobben I discloses a transportation system for a wind turbine blade in a horizontal position, including a transport box with a number of air filled cushions, which are used to anchor the blade inside the box. However, as acknowledged by the Examiner, Wobben I fails to disclose at least the steps of manufacturing a first and second shell of a wind turbine blade, and reinforcing at least one hole area of an inner surface of at least one of the shells by applying further layers of material. (Office Action, page 6).

Further, as discussed above, Wobben II discloses a system for attachment of a wind turbine blade to a rotor hub flange by means of bolts extending through the bores inside the blade, as well as through the bores inside the flange section. The Examiner asserts that Wobben II discloses “reinforcing at least one hole area of an inner surface of at least one of the shells by applying further layers of material,” and that it would have been obvious to one of ordinary skill in the art to modify the system of Wobben I to include this limitation. (Office Action, page 6). Applicants respectfully disagree. Wobben II suggests that the wind turbine blade may be enlarged in its base area (6) to provide a greater degree of strength in that area. (Col. 5, lines 9-15). However, Wobben II does not disclose or teach reinforcing at least one hole area of an inner surface of at least one of the blade shells. As clearly shown in Fig. 2 of Wobben II, the

thickening sections (8, 10) are formed on outside sides of the rotor blade (2), and are not used to reinforce the hole areas (12, 14) on the inner surface of the blade shells.

Stiesdal discloses a method of manufacturing a wind turbine blade in one piece inside a closed mold. The mold includes a mold core (3) inside mold part (22, 48) for formation of a mold cavity (51), in which fiber material (45, 47) and core material (46) are placed. After applying vacuum to the mold cavity (51), matrix material (57) is injected via a filling pipe (29). The molds are then opened and the finished blade is taken out. However, in contrast with the present invention, Stiesdal is not directed to a method of manufacturing a wind turbine blade adapted for easy handling during transportation and erection at a wind turbine site, and does not disclose the steps of reinforcing at least one hole area of an inner surface of at least one of the shells by applying further layers of material, and establishing at least one mounting hole penetrating surface of the wind turbine blade at the at least one hole area.

Because none of the cited prior art references disclose at least the above-discussed elements of claim 44, this claim, as well as all claims dependent therefrom, are patentable over the cited prior art.

Further, Applicants submit that a person of ordinary skill in the art would have been motivated to modify the transportation system for a wind turbine blade discloses in Wobben I by reinforcing the hole area of an inner surface of the wind turbine shells, as suggested by the Examiner. Wobben I teaches that the wind turbine blade is transported inside the box with a number of air filled cushions that anchor the blade in a horizontal position. Wobben I further discloses that the wind turbine blade may be “loosely” penetrated from above by a carrier bar, which serves the purpose of ensuring that the blade does not slide out of the box. Since the carrier bar only plays a secondary support function, while the blade is primarily anchored with air cushions inside the box, one of ordinary skill in the art would not have been motivated to reinforce the holes in the

wind turbine blade through which the carrier bar is passed to ensure a secure attachment of handling means to the blade.

Conclusion

For the foregoing reasons, Applicants respectfully submit that all pending claims, namely claims 37-70, are patentable over the references of record, and earnestly solicit allowance of the same.

Respectfully submitted,

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